

$\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

An apparatus and method for sputter depositing a magnetic film on a substrate to produce a magnetic device such as magnetic recording heads for reading digital information from a storage medium. The apparatus of the invention includes a sputtering chamber containing a target and a substrate, and a magnet array disposed within the chamber to form a substantially parallel magnetic field at a surface of the substrate. The sputtering chamber reduces interference between the magnetron and the magnet array by providing a long throw distance and/or a grounded collimator. The magnet array is preferably a circular ring.